

REMARKS

Claims 1-65 are pending in this application. Claims 1, 2, 4-12, 35 and 52-61 stand rejected under 35 U.S.C. § 102. Claims 3, 13, 14, 62 and 63 stand rejected under 35 U.S.C. § 103. Claims 15, 16, 64 and 65 are objected to as being dependent upon a rejected base claim. Applicants thank the Examiner for the indication of allowability for claims 17-34 and 36-51.

Amendments

Paragraphs [0008], [0014], [0028], and [0041] of the specification are amended only to correct obvious typographical errors, without adding any information or changing the scope of the claimed invention.

Claims 61 and 63 are amended only for the purpose of correcting typographical errors. These amendments are not made in order to overcome any objections or prior art.

Applicants hereby traverse the outstanding rejections and objections, and request reconsideration and withdrawal in light of the remarks contained herein.

Rejections under 35 U.S.C. § 102

The Examiner rejected claims 1, 2, 4-12, 35 and 52-61 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,335,819 to Cho et al. (hereinafter “Cho”). Applicants traverse the rejections and assert that the claims are allowable for, at least, the reasons stated below.

It is well settled that to anticipate a claim, the reference must teach every element of the claim, see M.P.E.P. §2131. Moreover, in order for a prior art reference to be anticipatory under 35 U.S.C. § 102 with respect to a claim, “[t]he elements must be arranged as required by the claim,” see M.P.E.P. § 2131, citing *In re Bond*, 15 US.P.Q.2d 1566 (Fed. Cir. 1990). Furthermore, in order for a prior art reference to be anticipatory under 35 U.S.C. § 102 with respect to a claim, “[t]he identical invention must be shown in as complete detail as is contained in the . . . claim,” see M.P.E.P. § 2131, citing *Richardson v. Suzuki Motor Co.*, 9 U.S.P.Q.2d 1913 (Fed. Cir. 1989). Applicants respectfully assert that the rejections do not satisfy these requirements.

Claim 1 requires, in part, “creating a chirped output signal having bits that correspond to the ‘1’ bits in the optical signal.” Cho does not teach this element of claim 1. Instead, Cho discloses that “a semiconductor electroabsorption modulator (SEAM) . . . outputs an optical regenerated signal that is a replica of the pump signal at a wavelength of the probe signal.” Cho, column 6, lines 44-48; claim 1, column 14, lines 43-48. Cho defines the pump signal as the input optical signal that is to be regenerated, and the probe signal as the CW laser. Cho, column 6, lines 19-37. Specifically, Cho teaches that the frequency of the output from the SEAM is equal to the frequency of the CW laser source, even during wavelength conversion, and is therefore not chirped. Cho, column 8, lines 14-23. Thus, Cho does not teach or suggest creating the claimed “chirped output signal” that has bits corresponding to the “1” bits in the optical signal.

Further, claim 1 requires “filtering signals to pass the chirped output signal and to block the CW signal.” Cho does not teach this element of claim 1. The only filters Cho discloses are “optical bandpass filter 140 . . . used to suppress the residual reflected pump pulses from the front facet of the SEAM” and bandpass filter 160 to suppress amplifier noise. Cho, column 7, lines 40-43 and column 9, lines 18-21; Figure 1. Cho teaches that the SEAM itself - not a filter - passes or blocks the CW signal. That is, the SEAM provides a non-linear transfer function for regenerating a signal. So eliminating the filter from Cho will not affect regeneration, but will merely allow amplifier noise and reflections of the input signal to enter the output path. Therefore, Cho does not teach or suggest filtering signals to pass the chirped output signal and to block the CW signal.

Claims 2 and 4-12 depend from base claim 1 and thus inherit all its limitations. Each of claims 2 and 4-14 also require features and limitations not taught or suggested by Cho. Thus, Applicants respectfully assert that for the above reason, claims 1, 2 and 14-12 are patentable over the 35 U.S.C. § 102(b) rejection of record.

Claim 35 requires, in part, “a CW optical signal from the CW laser and an input optical signal counter-propagate in [an electro -absorption modulator] EAM to create a chirped output signal.” Cho does not teach this element of claim 35. Instead, Cho discloses that the output signal that is at the same frequency as the CW laser, and is therefore not chirped. Cho, column 6, lines 44-48; claim 1, column 14, lines 43-48, and column 8, lines

14-23. Thus, Cho does not teach or suggest a CW optical signal and an input optical signal that counter-propagate in an EAM to create the claimed “chirped output signal.”

Claim 35 also requires “a filter coupled to the EAM wherein the filter passes the chirped output signal and blocks the CW optical signal.” Cho does not teach this element of claim 35. The only filters Cho discloses are “optical bandpass filter 140 … used to suppress the residual reflected pump pulses from the front facet of the SEAM” and bandpass filter 160 to suppress amplifier noise. Cho, column 7, lines 40-43 and column 9, lines 18-21; Figure 1. That is, the EAM provides a non-linear transfer function for regenerating a signal. So eliminating the filter from Cho will not affect regeneration, but will merely allow amplifier noise and reflections of the input signal to enter the output path. Therefore, Cho does not teach or suggest a filter coupled to the EAM wherein the filter passes the chirped output signal and blocks the CW optical signal.

Thus, Applicants respectfully assert that for the above reasons, claim 35 is patentable over the 35 U.S.C. § 102(b) rejection of record.

Claim 52 requires, in part, “means for creating a chirped output signal having bits that correspond to the ‘1’ bits in the optical signal.” Cho does not teach this element of claim 52. Instead, Cho discloses that the output signal that is at the same frequency as the CW laser, and is therefore not chirped. Cho, column 6, lines 44-48; claim 1, column 14, lines 43-48, and column 8, lines 14-23. Thus, Cho does not teach or suggest means for creating a chirped output signal having bits that correspond to the “1” bits in the optical signal.

Claim 52 further requires “means for filtering signals to a pass the chirped output signal and to block the CW signal.” Cho does not teach this element of claim 35. The only filters Cho discloses are “optical bandpass filter 140 … used to suppress the residual reflected pump pulses from the front facet of the SEAM” and bandpass filter 160 to suppress amplifier noise. Cho, column 7, lines 40-43 and column 9, lines 18-21; Figure 1. That is, the SEAM provides a non-linear transfer function for regenerating a signal. So eliminating the filter from Cho will not affect regeneration, but will merely allow amplifier noise and reflections of the input signal to enter the output path. Therefore, Cho does not teach or suggest means for filtering signals to a pass the chirped output signal and to block the CW signal.

Claims 53-61 depend directly from base claim 52 and thus inherit all its limitations. Each of claims 53-61 also require additional features and limitations not taught or suggested by Cho. Thus, Applicants respectfully assert that for the above reasons, claims 52-61 are patentable over the 35 U.S.C. § 102(b) rejection of record.

Rejections under 35 U.S.C. § 103

The Examiner has rejected claims 3, 13, 14, 62 and 63 under 35 U.S.C. § 103(a) as obvious in view of Cho. Applicants traverse the rejections and assert that the claims are allowable for, at least, the reasons stated below.

In order to establish obviousness, three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the references or combine reference teachings. Second, there must be a reasonable expectation of success. Third, the prior art cited must teach or suggest all the claim limitations. M.P.E.P. §2143.03. Without conceding either of the first two criteria, Applicants assert that each of the Examiner's rejections fails to satisfy the third criteria.

Additionally, the M.P.E.P. requires that prior art must be considered in its entirety, including disclosures that teach away from the claims. § 2141.02. Obviousness may therefore be rebutted by showing that the prior art teaches away from the claimed invention. M.P.E.P. §2144.05.

Claim 3 requires, in part, "the counter-propagating is performed in a semiconductor optical amplifier (SOA)." Cho explicitly teaches away from the use of SOAs. Specifically, Cho states, "Three conventional all-optical regeneration techniques, however, also have drawbacks." Cho, column 2, lines 9-10. The use of SOAs is one of the techniques identified by Cho as having drawbacks. See Cho, column 2, lines 18-29. Specifically, Cho identifies the following problems with SOAs: 1) broadband optical noise, 2) fabrication expense, 3) weak thresholding, 4) poor signal-to-noise quality, and 5) complex fabrication steps. Cho, column 2, lines 19, 20, 23, 24 and 26-27. Cho identifies the use of SEAMs as the solution to the alleged drawbacks of SOAs. Cho, column 2, lines 38-40. Thus, Cho clearly teaches away from the use of SOAs. One of skill in the art would not be motivated to incorporate

SOAs into the Cho system in view of Cho's clear rejection of such a technique. Therefore, the method of claim 3 would not be obvious in view of the Cho reference.

Further, claims 3 depends from base claim 1 and thereby inherits all the limitations of claim 1. Cho does not disclose these limitations, as discussed above. Thus, claim 3 sets forth features and limitations not recited by Cho. Accordingly, Applicants respectfully assert that for at least the above reasons, claim 3 is patentable over the 35 U.S.C. § 103(a) rejection of record.

Claims 13, 14, 62 and 63 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Cho. Applicants traverse the rejections and assert that the claims are allowable for at least the reason stated below.

Claims 13, 14, 62 and 63 depend from base claims 1 and 52, described above, and thus inherit all of the limitations of their respective base claims. Cho does not disclose these limitations, as discussed above. The Examiner's rejection under section 103 does not show where the missing limitations would be found in Cho. Thus, each of claims 13, 14, 62 and 63 sets forth features and limitations not recited by Cho. Therefore, the Applicants respectfully assert that for at least the above reason, claims 13, 14, 62 and 63 are patentable over the 35 U.S.C. § 103(a) rejection of record.

Objections

Claims 15, 16, 64 and 65 are objected to as being dependent upon a rejected base claim. Applicants respectfully traverse the objection and assert that independent base claims 1 and 52 are patentable, as discussed above, and, therefore dependent claims 15, 16, 64 and 65 are also patentable. Therefore, the Examiner is requested to withdraw the objections.

Conclusion

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 06-2380, under Order No. 64992/P001US/10308762 from which the undersigned is authorized to draw.

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